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DEPARTMENT OF NURSING EDUCATION

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IMPROVISING LABORATORY EQUIPMENT[1]

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Before discussing laboratory equipment and its improvisation I wish to speak briefly about the importance of adequate teaching facilities for schools of nursing. Our greatest need as teachers is an educational viewpoint. We must consider nursing as our major subject and the underlying and related sciences as forming a foundation and background from which to build.

The college student must plan her course so that from one-fourth to one-third of her time is spent on her major subject. The major subject of our nursing course should be nursing and more attention should be paid to the purely nursing subjects, less attention to the medical and surgical branches, as such, and more emphasis placed on the nursing relating to them.

The needs of the teaching department are then: first, good nursing laboratories, lecture rooms adapted to the size of the school, and science laboratories in which the basic science courses may be given.

There have been several splendid articles written describing teaching units which seem nearly ideal and for that reason I shall attempt no detailed description of lecture rooms or laboratories, but shall mention the most important characteristics of each in order to provide a standard by which to judge the methods of improvisation which follow.

Rooms.—In spite of having regretted the possible over emphasis placed upon medical lectures of various sorts, (using medical in its broader meaning), lecture rooms must be seriously considered as the most frequented in our department. The average sized school needs two: one, the larger, providing a meeting place for the entire student body for all formal lectures or "functions"; the other smaller, but large enough for any one class in the school and providing space for maps, models, charts, and skeleton. It is needless to mention large blackboards. Any director of a nursing school who has an instructor on her staff has heard, in all probability, a great deal about them.

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[1] Read before the National League of Nursing Education, Kansas City, Mo., April, 1921.

Laboratory.—The nursing laboratory increases in importance from year to year as we realize how necessary it is to correlate more closely theory and practice. Each student nurse, especially during the preliminary term, should perform every nursing procedure in the course as many times as is necessary to enable her to thoroughly understand how it is done and to form the roots of a habit of doing it in the way she has been taught. This means increasing equipment and increasing the time usually given to supervised practice. Ideally the room should be a miniature ward unit with service room, linen closet, supply closet, and such other accessory rooms bearing the same relation to each other that obtains in the hospital, so far as is practicable.

Models occupy the beds in the place of patients. There should be enough equipment conforming to the standards of the hospital to enable each student to derive the greatest benefit from the practice periods, but individual utensils for *every* procedure are not necessary or desirable. A few schools are able now to have such teaching and, as it becomes more general, we shall expect to find fewer variations in methods, fewer errors in technique and better care given the patients.

Provision must be made for the laboratory work of chemistry, bacteriology, anatomy and physiology, clinical diagnosis, dietetics and materia medica. The library, important as it is, cannot be discussed at this time and the dietetics laboratory belongs within the province of the dietitian where I shall not intrude. These courses, chemistry, anatomy, bacteriology, and so on, are the foundation upon which we build our nursing knowledge. It is not desirable to give our nursing student the same course in these sciences that is given to students whose aim is specialization, but the material must be as accurate, as well presented, and as thoroughly mastered.

Our standards can be taken from the practice of technical schools and colleges and the aim we find is individual equipment for laboratories. The best results are obtained if effort is exercised by the student and principles are better remembered and used in later work when the student has performed herself the illustrating experiments. Can all these subjects be cared for in one room? Yes, in any but the largest schools, by using a central supply room, by providing lockers for equipment, and by careful planning of schedules.

Having reviewed briefly the necessary teaching facilities for a modern school, we reach the real topic of this paper. Anything I can say about improvising must necessarily be based upon the personal experiences of the past few years. The School in which this improvising took place is a University School, young, when compared with other schools of nursing, but a new department of the University. From the beginning it has been felt that the work must equal that of the other departments; that lecture courses must be of a certain length and quality; that individual equipment must be provided in laboratory courses; that nursing work in the practice class be carefully supervised; that the schedule made must be carried out without variation.

For all this one room was available with the addition of a dietetics laboratory which relieved the one from the necessity of serving in that capacity. The room 24 x 22 feet, having been intended for use as an operating room, was well lighted, the floor tiled, and it contained a utensil rack, instrument sterilizer, and a small hopper with both hot and cold water. A small adjoining room, shared with the operating department, could be used as a temporary storage room. The first equipment consisted of chairs of the desk arm type, instructor's desk and chair, a blackboard, and a skeleton.

The first class, small and entering at irregular intervals, had been taught in the wards, but a new group entering for the preliminary course made necessary a nursing laboratory or demonstration room. The class chairs were moved to the left of the room, and three beds, bedside tables, and chairs, were placed along the vacant side. The carpenter put together three cabinets of pine with curtain rods at the front, and the instructor and the seamstress spent many hours manufacturing models. A word about the model's face. A wire gauze mask was brushed on the under side with melted parafine until the meshes of the gauze were occluded, when more was poured into the indentations to make the features firm. This, sewed to the model and given a coat of shellac, has stood innumerable baths and looks fairly presentable.

Utensils were gathered from the hospital supply, the articles needed for each procedure being requisitioned as need arose, and added to the collection. Two of the cabinets hold all the utensils, bottles of solutions, and boxes containing small supplies. The third cabinet contains linen; and on the utensil rack (relic of the operating room) are placed treatment trays, fitted in exact duplication of those in ward use. The irrigator standard tucks itself in between the cabinets which are placed on two sides of the room and anatomical models decorate their tops.

The work of the first semester began, and as the Anatomy and Physiology progressed microscopical work and dissection had to be done. To obtain microscopes was difficult, old ones from the medical school were renovated, and enough were put in working order to provide each student with one. By purchasing new ones, one or two at a time, the number has kept pace with the increase in the size of the classes. The next additions were four cheap kitchen tables, lowered by taking off an inch from the legs and covered with black rubber mackintosh, cut to fit, and tacked securely to the tops. These black covers gave good lighting for microscopical work and could be cleansed from stains more easily than wooden tops. When not in use the tables, piled one on top of the other, occupied the small store room. When a laboratory period was in order the class chairs were moved into the hall, the tables placed end to end to command good light, and straight backed chairs were brought from the wards to the class rooms. As the classes grew larger more tables were added, and the beds joined the hall decorations during laboratory period. The change from class room to laboratory could be made in ten minutes.

Clinical Diagnosis.—The next need was for a clinical diagnosis laboratory for second year students. The same arrangement of the room was made, stock boxes, 12 in. x 10 in. x 8 in. with card holders, were purchased and fitted with alcohol lamps and the necessary paraphernalia. Test tubes were kept in common stock and reagents were added to the boxes from day to day as needed. Two-quart earthenware jars, placed on the tables between two students, were used as waste containers.

Looking forward at the end of the second year to a nurses' home, we felt that "The Room" could soon be returned to its original purpose, and lectures, nursing practice and laboratory work give place to surgical operations, when calamity descended.

Until this time the work in Bacteriology had been given at the Medical School, an old building at considerable distance from the hospital, but early one morning in mid-winter, fire broke out and the laboratories were practically destroyed. A laboratory was hastily arranged for the medical students in another building, so small that it was in constant use and the nursing students could not be accommodated. The members of the pathological department, who conduct the nursing course, urged us to omit the work for the year. We felt that a preliminary course without bacteriology must not be considered, and the thought of making a course of that kind for three or four sections spurred us on to new effort.

More stock boxes, more equipment, and the room responded nobly. A gas burner was re-located beneath the instrument sterilizer, tapped by the engineer, and a three-inch connection with a shut-off inserted. To equip the laboratory tables with gas, two heavy boards

8 in. x 6 in. x 1 in. were fitted with gas piping of the same length. Attachments for burners with tube cocks were placed at proper intervals to allow one burner for each two students. A metal gas tubing connected the ends of these pipes to the supply pipe at the sterilizer. Wash bottles were made by fitting glass specimen bottles with rubber corks and glass tubing and, with the stain bottles, were placed in wooden racks to prevent upsetting while in the boxes. All culture media were made by the students in the diet laboratory, were sterilized in the operating room and stored in the diet laboratory ice chest.

This experiment, conducting bacteriological laboratory work in the class room, was undertaken with some hesitancy owing to the close proximity of the operating room and the necessity for doing all sterilization, even of used cultures, in our autoclaves. Because of this some rigid rules concerning cleaning and disinfecting were laid down. All used cultures were received in a large pail which was carried, covered, directly to the autoclave and placed inside. The time of sterilization was lengthened and no effect on operating room work could ever be detected.

These days in our history are nearly over. The class room is still used for lectures, class work, and nursing demonstrations and practice; but with the completion of one unit of a new medical school building two years ago, the necessity for using our class room as a science laboratory ended. The library and lecture rooms at the medical school are used by the nursing as well as the medical students and we are hopefully looking forward to our own teaching unit in the not distant future.

The instructor had the most difficult time during this period. The schedules of class and laboratory work had to be planned with great care in order to lose as little time as possible during the transformations and personal supervision was almost constant. It was extremely gratifying to have students who had taken college work speak of the way in which these courses compared with their previous science teaching.

In closing, I wish to emphasize three points. First, in these arrangements which have been described, the ideal of individual equipment and individual experience for the student was constantly in view and usually attained. Next, neither the instructor nor the director of the school has ever regretted for a minute the time or effort expended. Last, better results are obtained in solving a problem of this type by forming a clear concept of the desired result and by using the means at hand as tools for its accomplishment than by "making the best" of the tools we have. The first represents active effort, the last passive.